

**REMARKS**

Claims 49-79 are identical to finally rejected claims 1-31 from the Office Action in the parent application dated April 25, 2003. With respect to those references cited in the previous Final Office Action, the undersigned incorporates arguments addressing these references from previous responses. The outstanding rejections to claims 49-79 in the current Office Action include the following:

(a) Claims 49-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang '045, in view of Ikeda et al. EP 0087281 and Sutherland et al. WO 98/04650, further in view of Margerum et al. '568 and Caulfield, et al. "The Applications of Holography";

(b) Claims 49-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang '045, in view of Ikeda et al. EP 0087281, Sutherland, et al. WO 98/04650, Caulfield, et al. further in view of Margerum et al. '568 and either Eguchi et al. JP 03-188479 or Wreede et al. '118;

(c) Claims 49-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caulfield, et al. and Sutherland et al. WO 98/04650, in view of Margerum et al. '568, Sturdevant '946 and Redfield '861.

The undersigned representative respectfully traverses these rejections and responds to each rejection in turn as follows.

**(a) Rejection of claims 49-79 under 35 U.S.C. 103(a) as being unpatentable over Chang '045, in view of Ikeda et al. EP 0087281 and Sutherland et al. WO 98/04650 further in view of Margerum et al. '568 and Caulfield et al.**

In the rejection, the Office has cited references that teach or suggest the following:

A. Chang describes the formation of a **static** hologram that has different **static** diffraction efficiencies along the length of the hologram. Chang DOES NOT

TEACH OR SUGGEST forming this **static** hologram utilizing a first hologram, i.e., master hologram, to form a second hologram, i.e., replica hologram.

- B. Ikeda describes the replication of a **static** hologram using a master **static** hologram. Ikeda DOES NOT TEACH OR SUGGEST replication of an electrically switchable hologram, i.e., NOT **static**, with variable diffraction efficiencies. Further, the **static** holograms in Ikeda do not have different diffraction efficiencies within a single hologram.
- C. Sutherland-WO describes polymerizable materials for use in forming electrically switchable holograms having variable diffraction efficiencies. Sutherland-WO DOES NOT TEACH OR SUGGEST, *inter alia*, forming the electrically switchable hologram utilizing a first electrically switchable hologram, i.e., master electrically switchable hologram, to form a second electrically switchable hologram, i.e., replica electrically switchable hologram.
- D. Margerum '568 describes polymerizable materials for use in forming electrically switchable holograms having variable diffraction efficiencies. Margerum '568 DOES NOT TEACH OR SUGGEST, *inter alia*, forming the electrically switchable hologram utilizing a first electrically switchable hologram, i.e., master electrically switchable hologram, to form a second electrically switchable hologram, i.e., replica electrically switchable hologram.
- E. Caulfield et al. describe, briefly, the contact copying of **static** transmission or reflection holograms. Caulfield et al. DOES NOT TEACH OR SUGGEST, *inter alia*, replication of an electrically switchable hologram with variable diffraction efficiencies.

The undersigned appreciates the Office's comments regarding attacking references individually when they are used in combination to reject a claim. The undersigned lists the references above with a summary of the teachings therein in order to facilitate easier comparison between the claim limitations and the references. One of the three prongs that must be met in order to establish a *prima facie* case of obviousness is that each limitation of the claims must be taught or suggested by the references as combined. See MPEP § 2142. The undersigned has attempted below to match the teachings of the cited references with the limitations of the independent claims 49 and 70 below:

49. A system for duplicating a hologram (Ikeda & Caulfield) comprising:

a radiation source for emitting a coherent beam of radiation (All references);

a hologram having an electrically controllable variable diffraction efficiency (Margerum & Sutherland); and

a recording substrate comprised of a polymer-dispersed liquid crystal material (Margerum & Sutherland)// for recording a replica of the hologram having an electrically controllable variable diffraction efficiency therein (**No reference teaches**),// wherein the hologram and the recording substrate are in optical contact with one another and are placed in a path of the coherent beam of radiation (**No reference teaches**).

70. A method for duplicating a hologram (Ikeda & Caulfield) comprising:

directing a coherent radiation beam at a first optical component having a hologram with an electrically controllable variable diffraction efficiency recorded therein (**No reference teaches**);

diffracting a first portion of the coherent radiation beam via the hologram forming a diffracted radiation beam (**No reference teaches**);

transmitting a second portion of the coherent radiation beam through the first optical component forming a transmitted beam (**No reference teaches**); and

interfering the diffracted radiation beam with the transmitted radiation beam within a second optical component to form a replica of the hologram having an electrically controllable variable diffraction efficiency therein (**No reference teaches**).

Independent claims 49 and 70 included limitations to the replicating of a master electrically switchable hologram into a replica electrically switchable hologram by exposing the master electrically switchable hologram to a single beam that becomes two beams, transmitted and diffracted, by virtue of the holographic diffraction grating within the master electrically switchable hologram. The transmitted and diffracted beams interfere within the replica component to form a replica electrically switchable hologram.

From the stated review of the cited references, there is no reference that teaches or suggests utilizing an electrically switchable hologram master to split a single beam in order to replicate the electrically switchable hologram interference pattern within the electrically switchable hologram master through contact copying in a replica component, wherein the replica formed in the replica component contains the electrically switchable hologram interference pattern of the master. **Indeed, there is no cited reference that teaches using an electrically switchable hologram as a master to form any type of hologram, static or otherwise, through contact copying.**

Consequently, the undersigned submits that the Office has failed to meet the threshold requirements for establishing a *prima facie* case of unpatentability.

Specifically, according to well-established precedent, the examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. Further, in order to establish a *prima facie* case of obviousness, three basic criteria must be met:

- (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;
- (2) there must be a reasonable expectation of success; and
- (3) the prior art reference (or references when combined) must teach or suggest all the claim limitations.

In this case, the Office has failed to meet requirement (3) as is clearly shown by the claim limitation and reference teaching comparison set forth above.

Even assuming, *arguendo*, that requirement (3) has been met, requirement (1) has not. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). With respect to finding suggestion or motivation to combine references, the undersigned notes the following:

- The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).
- The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).
- A statement that modifications of the prior art to meet the claimed invention would have been " 'well within the ordinary skill of the art at the time the claimed invention was made' " because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).

In the Office Action, the Office correctly identifies that there are references (Sutherland-WO and Margerum '568) wherein a single electrically switchable hologram is formed

using a two beam optical set-up. These references do not suggest using that single electrically switchable hologram to then form a second replica electrically switchable hologram using a single beam, according to the limitations of claims 49 and 70. The Office also correctly identifies a reference (Ikeda) that uses a static master in a single beam configuration to form a replica of the static master. Finally, the Office correctly identifies a reference (Chang) teaching a static hologram that has different diffraction efficiencies along its length, although the static hologram is not formed using a master/replica configuration and the resulting hologram is not electrically switchable between different diffraction efficiencies.

The Office asserts that one skilled in the art would have found it obvious to:

- 1) form the static hologram having different diffraction efficiencies along its length of Chang using a master hologram and second the single beam copying method of Ikeda;
- 2) replace the static hologram of Chang with the electrically controllable variable diffraction efficiency PDLC hologram of Sutherland-WO in order to vary the diffraction efficiency during replication to get the various static diffraction efficiencies within the Chang static hologram; and
- 3) replace the holographic recording medium of Ikeda or Chang in order to make the Chang replication switchable between diffraction efficiencies along its length.

The undersigned appreciates the Examiner's assertions, but fails to see where these assertions are found in the references cited. Where is it suggested in the references cited to (1) use the contact copying methods of Ikeda to duplicate the **static** hologram of Chang? And NEXT, where is it suggested in the references cited to (2) use an electrically

controllable, variable diffraction efficiency hologram from Sutherland-WO as a master hologram to form the **static** hologram of Chang having **static** areas of varying diffraction efficiency utilizing the contact copying methods of Ikeda? And NEXT, where is it suggested to (3) replace the recording medium of Ikeda with an electrically controllable medium in order to duplicate the master hologram which is a modified Chang hologram that has been recorded in an electrically controllable medium which was obvious to do according to (3)?

With all due respect to the Office, the undersigned, who is intimately familiar with this application and the prosecution to date, is having a difficult time following the Office's arguments from pages 5-9 of the Office action, which appear to be attempting to show motivation. The fact of the matter is that the Office argues using a combination of 5 references (that do not even cover the claimed limitations as shown above) that it would be obvious to start with a primary reference that teaches a non-contact copying method to form a **static** hologram having **static**, varying, areas of diffraction efficiency and end up with a contact copying process that uses an electrically controllable variable diffraction efficiency master hologram to form a replica hologram also having an electrically controllable variable diffraction efficiency. The Office focuses much attention on the technical teachings of the individual references, but ultimately, (1) there is no reference that teaches **using an electrically switchable hologram as a master to form any type of hologram, static or otherwise, through contact copying** and (2) the motivation to combine the individual teachings is simply not shown. The Office has set forth numerous opinions, such as,

- The electrical control of the diffraction efficiency in a PDLC is clearly easier than moving a diffuser as taught by Change '045 or varying the

incident angle of the replay beam taught by Ikeda et al. EP 0087281 to generate the areas of reduced diffraction efficiency. See Office Action Page 6.

- In the case of Change '045, interference pattern formation is prevented at the edges by rendering the percentage of exposure less coherent in these areas which is the same effect achieved by reducing the diffraction efficiency of the grating when exposure of the edge regions occurs as more of the light merely passes through the hologram when the diffraction efficiency is reduced and by further replacing the holographic recording material of Ikeda et al. 00872181 or Chang '045 with a PDLC holographic recording material to produce a switchable hologram with faded edges so that it could be turned off when it was not desired to be in the drivers view and processing without the need for wet development. See Office Action Page 7.
- The PDLC materials of Sutherland et al. WO98/04650 can certainly be replayed when turned on and would therefore be able to be used as holographic masters. When in the off condition, no diffracted beams would be generated by the PDLC, no interference patterns would be generated and the exposure would be essentially uniform, which is recognized by Sutherland et al. WO98/04650. See Office Action Page 8.
- **The formation of edge-faded holograms requires both interferometric exposure and non-interferometric exposure. In the prior art, this may be achieved while using a laser for both exposures by the use of a diffuser placed in the beam path (Chang '045), adjusting the angle of the replay/reconstruction beam (Ikeda et al. EP 0087281) or not turning the PDLC hologram on (Sutherland et al. WO98/04650), leaving the beam undiffracted which is equivalent to the fixation exposure of Redfield '861.** Of these, clearly the easiest is modulating the PDLC material, which provides incentive to use a PDLC material as the diffractive master and more easily enable the edge diffracted PDLC hologram to be formed. See Office Action Page 8.

Initially, the undersigned must make it clear, for the record, that neither Ikeda nor Sutherland teach or suggest the formation of edge-faded holograms using the methods of adjusting the angle of the replay/reconstruction beam or not turning the PDLC hologram as suggested by the Office (See **bold** portions above). The statements above represent the opinions of the Office; not motivational teachings from the references cited.



The undersigned acknowledges that the Office has attempted to provide the necessary motivational teachings with basis in the cited prior art as opposed to the current specification. (See Preliminary Amendment filed 3/10/2004).<sup>1</sup> But the undersigned maintains that the opinions offered do not meet the Office's burden to find motivation to combine within the references cited. Accordingly, even assuming, *arguendo*, that the limitations of the claims are each taught or suggested by a cited reference [which the undersigned does not concede], the prior art simply does not provide the necessary motivation to combine the references. The undersigned respectfully maintains that claims 49-79 are allowable over the combination of references since the Office has failed to establish a *prima facie* case of unpatentability.

**(b) Claims 49-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang '045, in view of Ikeda et al. EP 0087281, Sutherland, et al. WO 98/04650, Margerum et al. '568 and Caulfield et al., further in view of Eguchi et al. JP 03-188479 and Wreede et al. '118**

The undersigned incorporates the arguments set forth above in section (a). The additional references cited in this rejection are Eguchi et al. JP 03-188479 and Wreede et al. Neither Eguchi et al. JP 03-188479 nor Wreede et al. cure the limitation or motivation deficiencies of the other five (5) references as described in section (a). Specifically, both Eguchi et al. and Wreede et al. are cited for teaching contact copying of a reflection hologram where the incident beam passes through the recording medium and is diffracted

---

<sup>1</sup> In re Gorman, 933 F.2d 982, 18 U.S.P.Q.2d 1885 (Fed. Cir. 1991)(It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps. Interconnect Planning, 774 F.2d at 1143, 227 USPQ at 551. The references themselves must provide some teaching whereby the applicant's combination would have been obvious.); McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 60 U.S.P.Q.2d 1001 (Fed. Cir. 2001)(The genius of invention is often a combination of known elements which in hindsight seems preordained. To prevent hindsight invalidation of patent claims, the law requires some "teaching, suggestion or reason" to combine cited references. Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed.Cir. 1997)).

to form a second beam by the underlying reflection medium, wherein the incident beam and the second beam interfere in the recording medium to duplicate the reflection hologram. Neither Eguchi et al. or Wreede et al. teach or suggest such a recording scenario wherein the reflection hologram has a variable diffraction efficiency. Consequently, there can be no teaching of the formation of a replica reflection hologram having a variable diffraction efficiency using single beam contact copying with a variable diffraction efficiency master. The combination of Chang '045, in view of Ikeda et al. EP 0087281 and Sutherland, et al. WO 98/04650, Margerum et al. '568, Caulfield et al. and Eguchi et al. JP 03-188479 and Wreede et al. '118 clearly does not teach or suggest a system or method which includes a hologram(s) used as a master hologram(s) for contact printing a replica(s) thereof, wherein the replica(s) and hologram(s) has an electrically controllable variable diffraction efficiency as set forth in independent claims.

**(c) Claims 49-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caulfield et al. and Sutherland et al. WO 98/04650, further in view of Margerum et al. '568, Sturdevant '946, and Redfield '861**

The undersigned incorporates the arguments set forth above in section (a). The additional references cited in this rejection are Sturdevant '946 and Redfield '861.

Neither Sturdevant '946 nor Redfield '861 cure the limitation or motivation deficiencies of the other three (3) references as described in section (a). Sturdevant is cited by the Examiner as teaching

“a continuous process where the holographic recording medium is preexposed without any pattern using UV light (21), Then the hologram is exposed using a laser and contact exposure through a holographic master (85) and then post exposed using a UV lamp (91).”

The Examiner cites Redfield as teaching a precure for depleting oxygen and reducing the induction period; carrying out the fixation exposure using a reference beam; and the use of spatial light modulators. These references were cited for their alleged teachings of limitations that are no longer recited in the pending claims. As such, the teachings do not cure the deficiencies of the previously cited references with respect to the pending claims. The combination of Caulfield et al., Sutherland, Margerum '568, Sturdevant '946 and Redfield '861 clearly does not teach or suggest a system or method which include a hologram(s) (reflection or otherwise) used as a master hologram(s) for contact printing a replica(s) thereof, wherein the replica(s) and hologram(s) has an electrically controllable variable diffraction efficiency as set forth in independent claims.

**CONCLUSION**

In view of the remarks stated above, the undersigned representative respectfully requests that the rejections of claims 49-79 be withdrawn. A notice of allowance to this effect is earnestly solicited. Should the Office require further information and/or feel that contacting the undersigned will expedite prosecution, the Office is invited to do so at the number provided below.

Respectfully submitted,

Date: 1/24/05  
KILPATRICK STOCKTON LLP  
Suite 900  
607 14th Street, N.W.  
Washington, D.C. 20005  
(202) 508-5889

By: /Dawn-Marie Bey Reg. No.44,442/  
Dawn-Marie Bey  
Registration No. 44,442